AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) ~~Method~~ A method for determination of ~~the~~ transmission behavior of an optical waveguide by ~~means of~~ ray tracing, ~~with the following features~~comprising:

[[-]] undertaking a~~The~~ spatial representation of the optical waveguide ~~is undertaken~~ as spatial combination of two or more guide pieces with an analytically representable surface, for which in each case an analytical method for determination of ~~the~~ intersection points of a spatial straight line with the surface is produced; and

[[-]] determining the~~The~~ transmission behavior ~~is determined~~ by the ray tracing of a test ray, ~~by determining~~ intersection points of the test ray with the surface of the guide pieces until such time as an intersection point is found which belongs to a real material transition.

2. (Currently Amended) ~~Method~~ The method according to claim 1, ~~with~~wherein the determination as to whether a real material transition is present ~~being undertaken as follows~~ comprises:

[[-]] ~~Initially all~~initially determining intersection points of the test ray with the surfaces of ~~all~~ guide pieces ~~are determined~~;

[[-]] sorting the~~These~~ intersection points ~~are sorted~~ in ascending order of ray direction and investigated in ~~this~~the order, starting from ~~the~~an origin;

[[-]] ~~If~~if the origin is located outside the optical waveguide, finding the first intersection point ~~found is~~as one with a real material transition;

[[-]] ~~Otherwise~~ if the origin is not located outside the optical waveguide, the angle between ~~the~~ a normal to the surface of ~~the~~an associated waveguide section and ray direction is used to determine whether an entry or exit is present in the guide piece; and

[[-]] determining a~~A~~ real material transition is present if an intersection point is reached in which, for each entry in a part piece, an exit has also occurred with predetermined entries initially being set in accordance with the position of the origin.

3. (Currently Amended) ~~Method~~ The method according to claim 1, ~~with~~wherein the determination as to whether a real material transition is present ~~being undertaken as follows~~ comprises:

[[-]] ~~Initially~~ initially determining~~all~~ intersection points of the test ray with the surfaces of ~~all~~ guide pieces ~~are determined~~;

[[-]] sorting the~~These~~ interfaces ~~are sorted~~ in ascending order of ray direction and investigated in ~~this~~the order, starting from ~~the~~an origin;

[[-]] ~~If~~if the origin is located outside the optical waveguide, finding the first intersection point ~~found is~~ as one with a real material transition;

[[-]] ~~Otherwise~~If the origin is not located outside the optical waveguide, for each intersection point one further test point in each case in ~~the~~ a direction of the ray and opposite to ~~the~~ a direction of the ray is investigated as to whether it lies inside one of the part pieces; if the result is different for the two test points, a material transition is present.

4. (Currently Amended) ~~Method~~ The method according to claim 1, ~~with~~wherein the determination as to whether a real material transition is present ~~being undertaken as follows~~ comprising:

[[-]] determining successively, ~~For~~for the guide pieces intersection points of the test ray with the surface of the guide piece, ~~are determined successively~~ and investigated with the subsequent steps;

[[-]] determining, ~~For~~for each intersection point one test point in each case in ~~the~~a same direction and in ~~the~~an opposite direction to the ray, ~~is determined~~ with a small predetermined distance from the intersection point; and

[[-]] investigating ~~Each~~each of ~~these~~the test points ~~is investigated~~ to see whether it lies inside one of the part pieces; if the result is different for the two test points, a material transition is present.

5. (Currently Amended) ~~Method~~ The method according to claim 3, ~~with the following modification:~~ wherein

[[-]] ~~The~~ normals to the surface are used to determine the direction in which there is an exit from the part piece and a test point is determined in ~~this~~ the direction; if it does not lie within another guide piece, a material transition is present.

6. (Currently Amended) ~~Method~~ The method according to claim 1, with the determination as to whether a real material transition is present ~~being undertaken as follows~~ comprising:

[[-]] ~~Initially all~~initially determining intersection points of the test ray with the surfaces of ~~all~~ guide pieces are determined;

[[-]] ~~These~~sorting the interfaces ~~are sorted~~ in ascending order of ray direction and investigated in ~~this~~ order, starting from ~~the~~an origin; and

[[-]] determining, ~~For~~for each intersection point, ~~it is determined~~ whether it lies inside one of the other part pieces; if ~~this is~~ not the case, a material transition is present.

7. (Currently Amended) ~~Device~~ A device for simulation of optical waveguides ~~in which one of the methods in accordance with one of the previous claims is used.~~, where the device performs the following:

undertaking a spatial representation of the optical waveguide as spatial combination of two or more guide pieces with an analytically representable surface, for which in each case an analytical method for determination of intersection points of a spatial straight line with the surface is produced; and

determining the transmission behavior by the ray tracing of a test ray, intersection points of the test ray with the surface of the guide pieces until such time as an intersection point is found which belongs to a real material transition.